

[0029] Having thus described the invention, what is claimed is:

1 1. In a harvesting machine having a frame adapted for movement over the
2 ground, the frame having a front end, an opposing rear end, and an operator's
3 platform, an elongate crop harvesting header having a first end and a second
4 opposing end, the first and second ends defining the length of the elongate
5 header, the header supported at first and second support points, intermediate the
6 first and second ends, by the frame across the front end of the frame for
7 generally vertical movement relative to the ground, the improvement comprising:
8 a header lift and flotation system interconnecting the header and the frame
9 for selectively raising and lowering the header relative to the ground and setting
10 flotation parameters, the header lift and flotation system including:
11 left and right hand hydraulic cylinders interconnecting the frame and the
12 header adjacent the respective first and second support points;
13 a hydraulic fluid reservoir;
14 an electro-hydraulic circuit, including valves operated by electrical signals,
15 interconnecting the hydraulic fluid reservoir and the respective left and right hand
16 hydraulic cylinders;
17 a manually manipulated switch;
18 an electronic programmable controller interconnecting the switch and the
19 valves such that manipulation of the switch causes the controller to emit electrical
20 signals to the valves to establish flotation and lift settings therefor.

1 2. The improvement of claim 1, wherein:
2 the electro-hydraulic circuit further includes an hydraulic pump and a
3 single hydraulic accumulator.

1 3. The improvement of Claim 2, wherein:
2 the switch is located on the operator's platform.

1 4. The improvement of claim 3, wherein:
2 the switch is a rocker switch.

1 5. The improvement of claim 4, wherein:
2 each of the left and right hand hydraulic cylinders has a lifting end which,
3 when hydraulic oil under pressure is applied, raises the header, and the two
4 lifting ends of the left and right hand hydraulic cylinders are hydraulically
5 connected together and thence to the hydraulic pump, a control manifold and the
6 accumulator; and
7 the switch has a first position that signals the controller to allow hydraulic
8 oil to enter the accumulator to reduce header contact force with the ground.

1 6. The improvement of claim 5, wherein:
2 the switch has a second position that signals the controller to allow
3 hydraulic oil to exit the accumulator to increase header contact force with the
4 ground.

1 7. The improvement of claim 6, further including:
2 a pressure reducing valve located in the hydraulic circuit such that through
3 manipulation of the pressure reducing valve hydraulic pressure can be selectively
4 applied to one or the other of the left and right hand hydraulic cylinders.

1 8. The improvement of claim 7, wherein:
2 the pressure reducing valve is electro-hydraulic; and
3 a second switch is located on the operator's platform, and is electrically
4 connected to the pressure reducing valve to control the pressure reducing valve

5 to selectively apply hydraulic pressure to one or the other of the left and right
6 hand hydraulic cylinders.

1 9. In a harvesting machine having a frame adapted for movement over the
2 ground, the frame having a front end, an opposing rear end, and an operator's
3 platform, an elongate crop harvesting header having a first end and a second
4 opposing end, the first and second ends defining the length of the elongate
5 header, the header supported at first and second support points, intermediate the
6 first and second ends, by the frame across the front end of the frame for
7 generally vertical movement relative to the ground, the improvement comprising:
8 a header lift and flotation system interconnecting the header and the frame
9 for selectively raising and lowering the header relative to the ground and setting
10 flotation parameters, the header lift and flotation system including:
11 left and right hand hydraulic cylinders interconnecting the frame and the
12 header adjacent the respective first and second support points;
13 a hydraulic fluid reservoir;
14 substantially independent left and right hand electro-hydraulic circuits,
15 including valves operated by electrical signals, interconnecting the hydraulic fluid
16 reservoir and the respective left and right hand hydraulic cylinders;
17 left and right hand manually manipulated switches;
18 an electronic programmable controller interconnecting the switches and
19 the valves such that independent manipulation of the switches causes the
20 controller to emit electrical signals to the valves to establish independent flotation
21 and lift settings for the left and right hand hydraulic cylinders.

1 10 the improvement of claim 9, further including:
2 a pressure reducing valve located in the hydraulic circuit such that through
3 manipulation of the pressure reducing valve hydraulic pressure can be selectively
4 applied to one or the other of the left and right hand hydraulic cylinders.

1 11. The improvement of claim 10, wherein:
2 the pressure reducing valve is electro-hydraulic; and
3 a second switch is located on the operator's platform, and is electrically
4 connected to the pressure reducing valve to control the pressure reducing valve
5 to selectively apply hydraulic pressure to one or the other of the left and right
6 hand hydraulic cylinders.

1 12. The improvement of claim 11, wherein:
2 the electro-hydraulic circuit further includes an hydraulic pump and a
3 single hydraulic accumulator.

1 13. The improvement of Claim 12, wherein:
2 the switch is located on the operator's platform and is a rocker-type
3 switch.

1 14. The improvement of claim 9, wherein:
2 the switch has a first position that signals the controller to allow hydraulic
3 oil to enter the accumulator to reduce header contact force with the ground, and
4 the switch has a second position that signals the controller to allow
5 hydraulic oil to exit the accumulator to increase header contact force with the
6 ground.

1 15. The improvement of claim 14 wherein:
2 the valves return to the preset flotation condition whenever the float mode
3 is selected, irrespective of subsequent header lift and lower operations.
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1 16 A crop harvesting machine comprising:
2 a self-propelled frame adapted for movement over the ground, the frame
3 having a front end, an opposing rear end;
4 an operator's platform affixed to and supported by the frame;

1 an elongate crop harvesting header having a first end and a second
2 opposing end, the first and second ends defining the length of the elongate
3 header, the header supported at first and second support points, intermediate the
4 first and second ends, by the frame across the front end of the frame for
5 generally vertical movement relative to the ground;

6 a header lift and flotation system interconnecting the header and the frame
7 for selectively raising and lowering the header relative to the ground and setting
8 flotation parameters, the header lift and flotation system including:

9 left and right hand hydraulic cylinders interconnecting the frame
10 and the header adjacent the respective first and second support points;

11 a hydraulic fluid reservoir;

12 an electro-hydraulic circuit, including valves operated by electrical
13 signals, interconnecting the hydraulic fluid reservoir and the respective left and
14 right hand hydraulic cylinders;

15 the left and right hand hydraulic cylinders are hydraulically
16 connected such that hydraulic oil is sent to the return side of the respective
17 cylinder on the lighter side of the header;

18 a manually manipulated switch; and

19 an electronic programmable controller interconnecting the switch and the
20 valves such that manipulation of the switch causes the controller to emit electrical
21 signals to the valves to establish flotation and lift settings for the left and right
22 hand hydraulic cylinders.

1 17. The crop harvesting machine of claim 16, wherein:

2 the electro-hydraulic circuit further includes an hydraulic pump and single
3 hydraulic accumulator.

1 18. The improvement of Claim 17, wherein:

2 the switch is located on the operator's platform.

1 19. The improvement of claim 18, wherein:
2 the switch is a rocker switch;
3 the switch has a first position that signals the controller to allow hydraulic
4 oil to enter the respective accumulator to reduce header contact force with the
5 ground; and
6 the switch has a second position that signals the controller to allow
7 hydraulic oil to exit the respective accumulator to increase header contact force
8 with the ground.

1 20. The improvement of claim 18, further including:
2 a pressure reducing valve located in the hydraulic circuit such that through
3 manipulation of the pressure reducing valve hydraulic pressure can be selectively
4 applied to one or the other of the left and right hand hydraulic cylinders.

1 21. The improvement of claim 20, wherein:
2 the pressure reducing valve is electro-hydraulic; and
3 a second switch is located on the operator's platform, and is electrically
4 connected to the pressure reducing valve to control the pressure reducing valve
5 to selectively apply hydraulic pressure to one or the other of the left and right
6 hand hydraulic cylinders.